

Patent Claims

**REPLACED BY
ART 34 AMDT**

1. A superconductor device
 - having a magnet which contains at least one super-
5 conductive winding without any refrigerant,
 - having a refrigeration unit which has at least one cold head,
and
 - having means for thermal coupling of the at least
10 one winding to the at least one cold head,
characterized in that the thermal coupling means are in
the form of a line system (10) having at least one
pipeline (10a, 10b; 15i) for a refrigerant (k1, k1';
k2) which circulates in it on the basis of a thermo-
15 siphon effect.
2. The device as claimed in claim 1, characterized in
that the line system (10) has two pipelines (10a, 10b)
which are filled with different refrigerants (k1 and
20 k2, respectively) with different condensation
temperatures.
3. The device as claimed in claim 2, characterized in
that the pipelines (10a, 10b) are thermally coupled to
25 a common cold head (6).
4. The device as claimed in claim 2, characterized in
that the pipelines are thermally coupled to separate
cold heads.
30
5. The device as claimed in one of the preceding
claims, characterized in that at least parts of the at
least one pipeline (10a, 10b) have a gradient with
respect to the horizontal (h) of more than 0.5°,
35 preferably more than 1°.

6. The device as claimed in one of the preceding claims, characterized in that the cross section (q) of the at least one pipeline (10a, 10b) which carries the refrigerant (k1, k1'; k2) is less than 10 cm².

5

7. The device as claimed in one of the preceding claims, characterized in that the superconductive winding (4a, 4b; 14j) contains high-T_c superconductor material.

10

8. The device as claimed in claim 7, characterized in that the superconductor material must be kept at a temperature below 77 K.

15

9. The device as claimed in one of the preceding claims, characterized in that a mixture of two or more refrigerant components with different condensation temperatures is provided as the refrigerant (k1 or k2, respectively).

20

10. The device as claimed in one of the preceding claims, characterized in that the superconductive magnet (3, 13) is part of an MRI installation.